

Appendix A (clean net claims)

*a<sub>1</sub>*  
1. Method for the production of  $\text{Al}_2\text{O}_3/\text{SiC}$  nanocomposite abrasive grains, characterized by the fact that an aluminum-oxide containing sol is mixed with sinter additives and SiC nanoparticles and subsequently gelled, dried, calcined and sintered the sintering being conducted by heating the mixture in the range between 1300°C and 1600°C.

*a<sub>2</sub>*  
4. Method according to either of Claims 1 or 2, wherein that prior to the gelling, sintering additives in the form of crystallization seeds, crystal growth inhibitors and/or other modifying components that influence the sintering process are added.

*a<sub>3</sub>*  
6. Method according to either of Claims 1 or 2, wherein the gelling of the suspensions occurs by increasing or decreasing the pH value; through aging; the addition of electrolytes; increased temperature; and/or concentrating the solution. -

*a<sub>4</sub>*  
7. Method according to either of Claims 1 or 2, wherein drying of the gel is carried out in a temperature range between 50 °C and 120 °C, with subsequent calcination between 500 °C and 800 °C, and sintering in a temperature range between 1300 °C and 1600 °C.

*a<sub>4</sub>*  
10. Method according to either of Claims 1 or 2, wherein comminution to the desired grain size is done before or after sintering.

*a<sub>5</sub>*  
13.  $\text{Al}_2\text{O}_3/\text{SiC}$  nanocomposite abrasive grain according to either of Claims 11 or 12, wherein the SiC particles are predominantly present intragranularly in the  $\text{Al}_2\text{O}_3$  matrix.

*a<sub>5</sub>*  
14.  $\text{Al}_2\text{O}_3/\text{SiC}$  nanocomposite abrasive grain according to either of Claims 11 or 12, wherein the  $\text{Al}_2\text{O}_3$  crystals of the matrix show mean diameters of between 0.2  $\mu\text{m}$  and 20  $\mu\text{m}$ .

*a<sub>6</sub>*  
15.  $\text{Al}_2\text{O}_3/\text{SiC}$  nanocomposite abrasive grain according to either of Claims 11 or 12, wherein the  $\text{Al}_2\text{O}_3$  matrix has a submicron structure and a mean particle size of < 1  $\mu\text{m}$ , preferably < 0.5  $\mu\text{m}$ .

*a<sub>6</sub>*  
19.  $\text{Al}_2\text{O}_3/\text{SiC}$  nanocomposite abrasive grain according to either of Claims 16 through 18, wherein the coarse  $\text{Al}_2\text{O}_3$  crystals have a length/width ratio of between 2:1 and 10:1, preferably between 4:1 and 6:1.

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20. Utilization of  $\text{Al}_2\text{O}_3/\text{SiC}$  nanocomposite abrasive grains according to Claim 11 in combination with backing substrates or materials to comprise grinding belts or grinding disks.

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